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Combat Crew

strategic air command

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NOVEMBER 1976

FLARE

Combat Crew

Magazine of the Strategic Air Command - 27th Year of Publication

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ON OUR COVER

This month's cover depicts a SAC aircraft landing in crosswind conditions. For more on this subject, see page 4.

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MAINTENANCE— CAN YOU SPELL IT?

Major General John J. Murphy
Deputy Chief of Staff for Logistics, SAC

The December 1975 Combat Crew contained an article by Lieutenant General Keck, Vice Commander in Chief, SAC, entitled "Your Career — Where Will It Lead?" If you haven't read it, I strongly recommend you take the time to do so. This commentary contains some of the most candid advice and comments I have seen in a long time. I don't intend to review General Keck's article for you in this issue of Combat Crew; however, I do want to address General Keck's advice to "get diversified experience and exposure" when offered and to propose an answer to the crewmember's question, "What should I do when I finish crew duty?"

Before we can attempt to answer this question, I think we should philosophize a bit. First, your basic question probably is "How do I get promoted?" The simplistic answer is, demonstrate your ability to do many things well within your assigned career field. The key word here is **demonstrate.** The Air Force "whole person" concept assumes all officers of all grades are potential leaders and managers, yet differ in education, experience and capacity. The various levels of professional military education (PME) were designed to provide each officer the philosophy, organizational knowledge, tactics and staff skills required at appropriate phase points in an ascending military career. PME and formal education help to prepare the officer for command and management and, therefore, should be pursued. The variable for each officer is how well can he apply the education. Promotions are based on future potential for increased responsibilities in command and management. Judgment of this potential is based largely on demonstrated ability to cope with many and varied tasks. There is that word again and believe me after you have **demonstrated** your abilities in several areas (instructor, evaluator, etc.) your commanders will seek you out for other jobs. I want to emphasize that potential can be highlighted in the combat crewmember career fields equally as well as any other specialty. My purpose, in this article, is not to lure you away from your current career field, but to give some insight into the maintenance business. Then, when the opportunity

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WING LOW SWEET

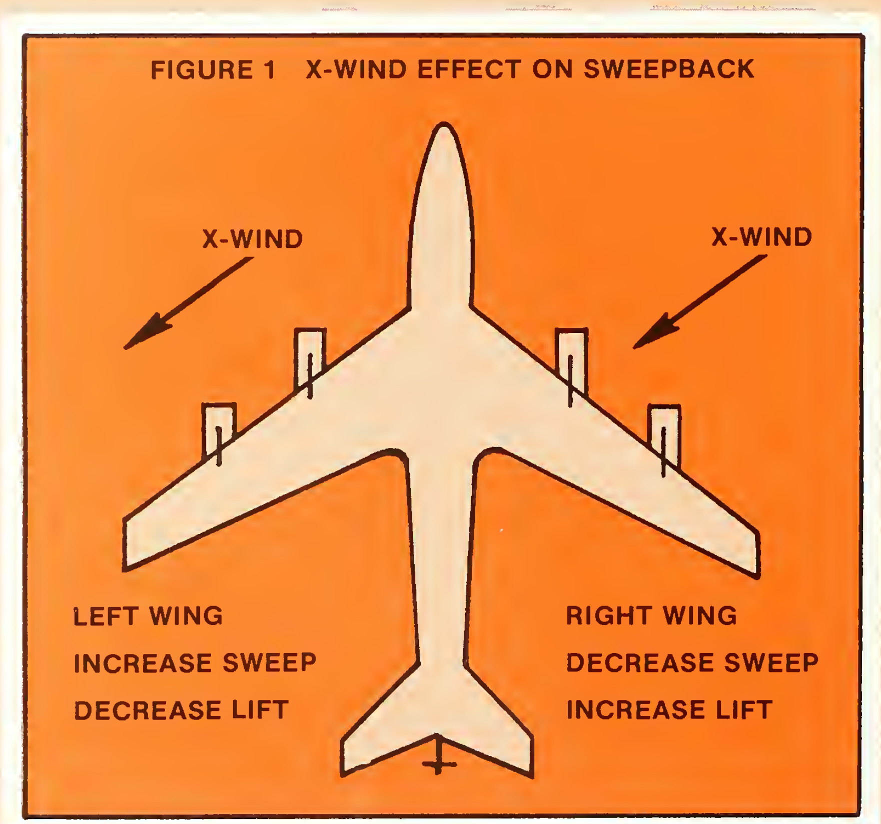

FIGURE 1 X-WIND EFFECT ON SWEEPBACK

Captain Ron Langenfeld
55SRW, Offutt AFB

Although the engine pods on a 135 were not designed to function as outriggers, there have on occasions been instances when pilots have put these nacelles to the "Outrigger Test". The result has been severe engine fires, loss of engine thrust, costly material repairs, and considerable "blood-letting" for all concerned. Crosswinds have a direct effect on the aerodynamic forces and moments on the 135. To better understand the aircraft capabilities and recommended Dash One techniques, there are certain basic aerodynamic forces which deserve consideration. The principal surface which contributes to the lateral stability of an aircraft is the wing. With the relative wind coming from one side, the upwind wing has less relative sweep and an increase in lift results (see Fig. 1).

The downwind wing has more sweep and a decrease in lift results.

CHARIOT

These changes in lift cause a rolling moment which tends to raise the upwind wing. The upwind wing is also subject to an increase in the Angle of Attack (see Fig. 2).

The directional stability of an aircraft involves moments about the vertical axis. The vertical stabilizer is the primary source of directional stability. Side forces against the vertical stabilizer (such as in a crosswind create a yawing moment about the center of gravity which tends to turn the airplane into the wind. This tendency to turn into the wind is further aggravated by the aileron/spoiler inputs used to negate the rolling tendency previously discussed (see Fig. 3).

When you're on the ground and you want to keep a true path going straight down the runway, opposite rudder is required to counteract the weather-vaning effect. It is at this point (approaching S-1) that the significance of the loss of an upwind engine becomes apparant. The amount of rudder used to compensate for weather-vaning reduces the amount of rudder available for directional control should an upwind engine fail. As the airspeed increases up to S-1, the pilot assumes directional control with the rudder. The wings are held level by use of the lateral controls and the aircraft is now in a sideslip going down the runway. Care must be taken not to overcontrol on opposite rudder, but use only that amount required to stay on centerline (see Fig. 4).

Continue to use whatever control imputs are necessary to keep the wings level all through rotation and lift off. There is a special procedure for crosswind takeoffs in Section II of the Dash One which with all pilots should be familiar.

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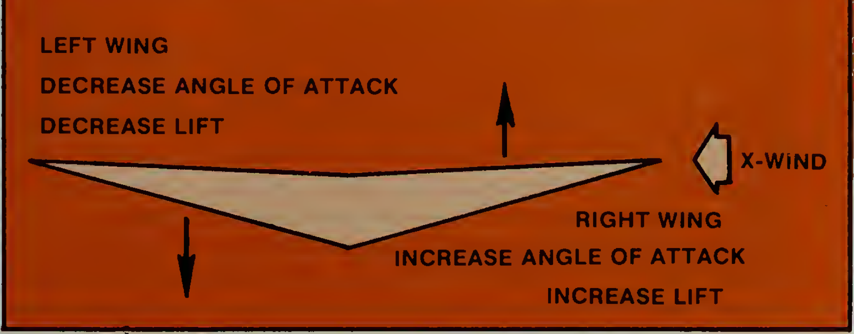
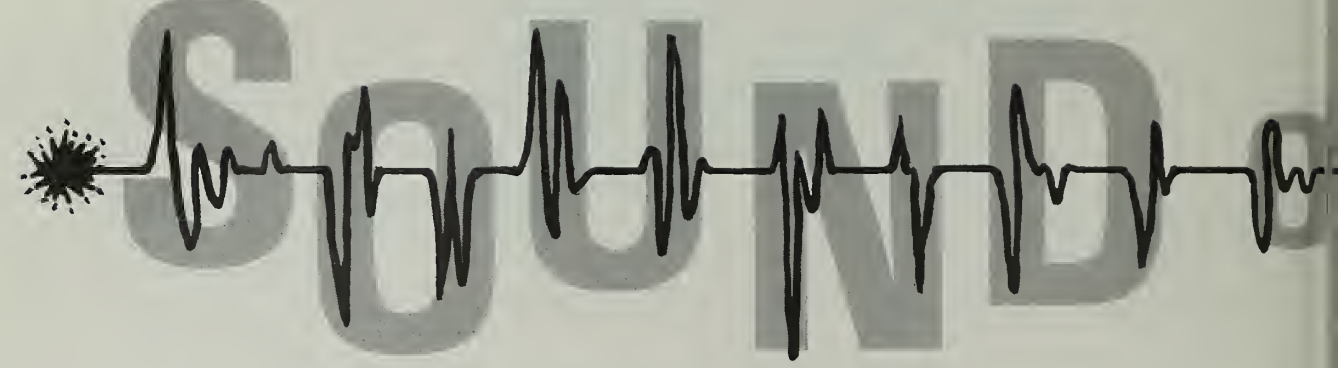
FIGURE 2 X-WIND EFFECT ON DIHEDRAL





Captain Nicholas J. Hinch
77 Bomb Sq, Ellsworth AFB

If anyone had ever asked me what I would do in the case of radio failure in a B-52, I would have said, "You've got to be kidding!" I had been on flights where one of the radios quit, but never two, and certainly not three. Why that's an impossibility. Right? Wrongo, wonder wings! The impossible happened. I guess I never would have believed it if I hadn't been there to witness it and to cope with the problem along with the rest of the crew. Of course, it couldn't be as simple as that for where there's one problem, there's usually another.

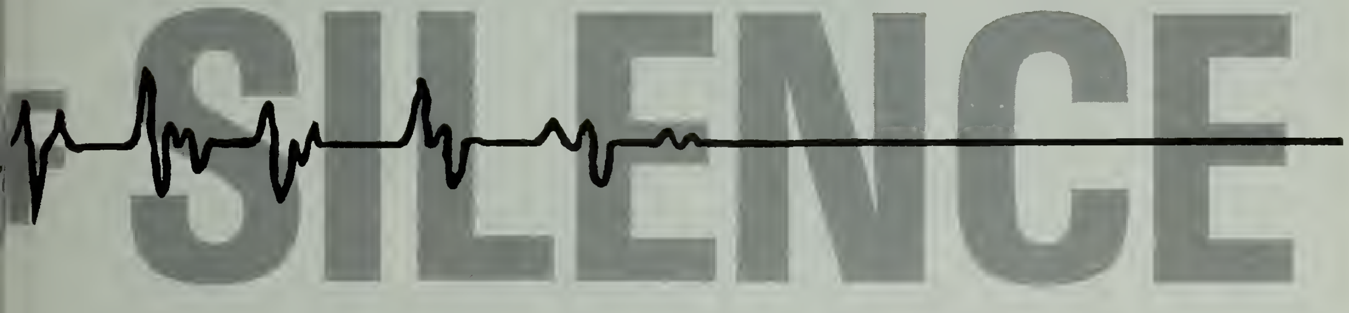
Our night flight started off smoothly enough with preflight and an on-time launch. But we noticed that the HF seemed very weak as we taxied out. Up through air refueling, it has been a normal mission. Just as we finished onloading our fuel, however, the master caution light glared at us and the number seven hydraulic light came on. We agreed to cease our air refueling practice and to "Stop — Think — Collect Your Wits." We dropped back from the tanker, descended to the bottom of the block and asked him to remain with us until the end of the track in case we needed any outside assistance.

Referring to Section 3 of the Dash One, we accomplished the Hydraulic System Failure checklist and found that our backup standby pump was not going to provide pressure. Since we then knew that our right wing outboard spoiler group was inoperative and that our right tip gear would not extend normally, we researched those problems further. The gear problem could wait until return to the local area, and the pulling of the outboard airbrake control circuit breaker solved our asymmetrical spoiler problem for the moment.

Because of our position and distance from receiving stations, we were unable to contact any SAC Command Post on UHF. We also determined at that time that the HF was completely inoperative. No amount of tinkering or cajoling would wake it from the dead. I remembered, from having pulled satellite alert at Mountain Home AFB, that there had been a TAC Command Post located there. A quick check of the IFR Supplement confirmed this, and through them a phone patch was established back to our home unit. Thus, everything that could be done so far had been done, and we continued on to low level.

All went smoothly at Hawthorne, and we had just leveled off at FL 410 on our return to base nav leg when number one radio joined our HF in silence. It was recycled from off to on several times, but to no avail. Well, our number two radio was still good and we were heading for home so all we had to do was hang in there.

After about 15 minutes of quiet had passed, however, I had a premonition that the silence was not due to the fact that it was three o'clock in the morning. This was confirmed when another aircraft called us on our guard receiver with a new frequency for contacting center. Contact could not be made on the assigned frequency, any other frequency, and guard also seemed to have given out. Thus, the



SILENCE

never-thought-possible had happened. All our air to ground communications were gone.

Radio out procedures are something we were intimately familiar with in pilot training, but somehow we let the knowledge slip in the realization that in our multiradio aircraft it could never happen to us. If you know where to look for the answer, however, your problem is solved. The IFR Supplement is the place to look and towards the back a special section has been included to answer all of your questions. In our particular case, we had already been cleared at altitude for our return to Ellsworth and all we needed to do was fly our routing back to the IAF at the last assigned altitude, or Minimum Enroute Altitude if we were on airways route, whichever was higher.

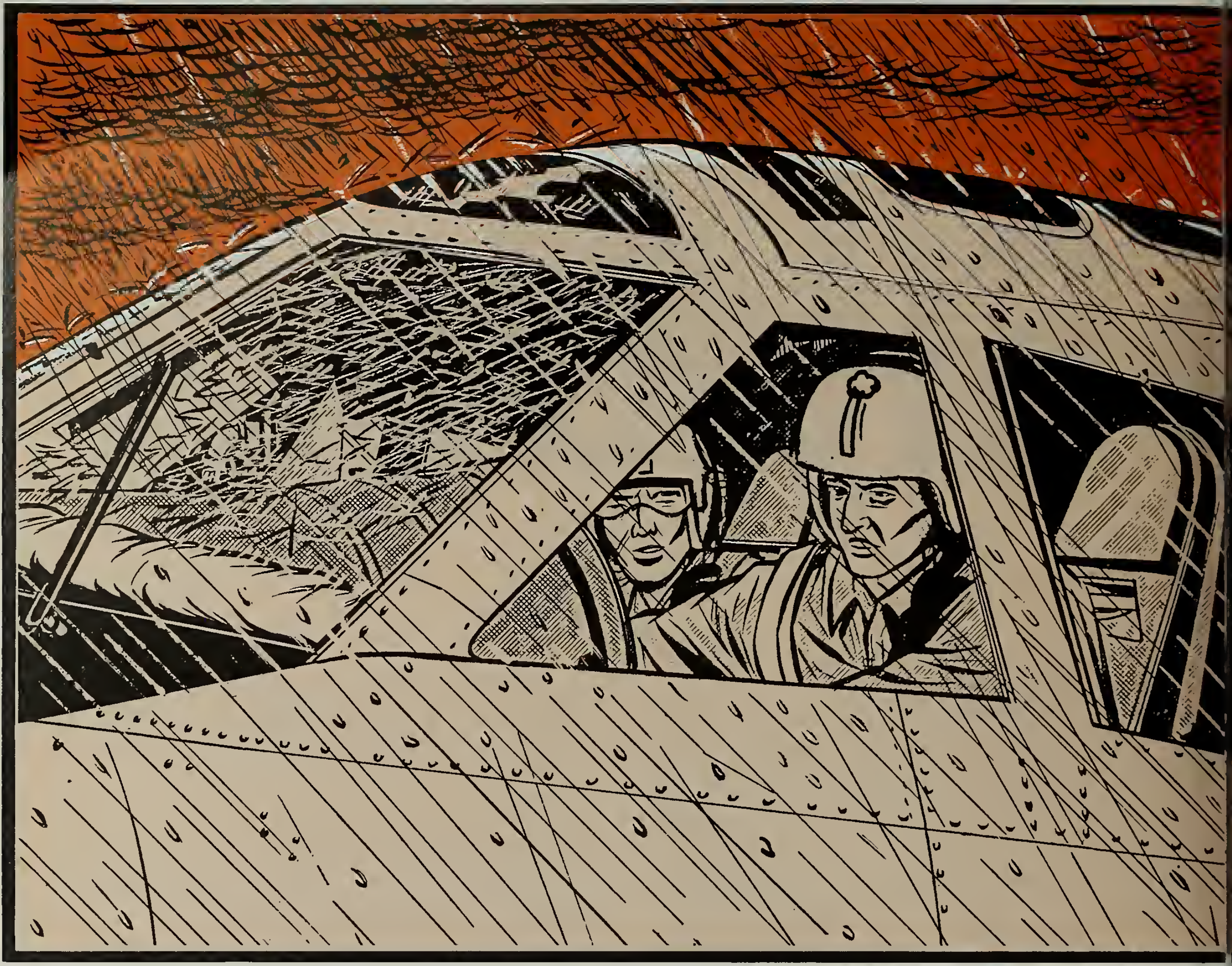
Upon arriving at the IAF we would enter holding at that assigned altitude, orbit until the penetration time listed on our flight plan, then descend in holding until we reached the penetration altitude, and fly our normal penetration and approach to a full stop landing. ARTC would clear a path for us. We would squawk Mode 3 code 7700 for one minute then code 7600 (radio out) for the next 15 minutes with a continuous repetition of this procedure as we returned home. Also, we would maintain a listening watch on the VOR navigation frequency.

Luckily for us, after instituting these initial procedures and having recycled our number two radio several times, we found that the guard receiver was working. Center gave us information to which we replied through various IFF settings and the ident feature. Following an enroute descent, we completed the Landing Gear Failure To Extend checklist and digested everything in the section dealing with Landing With Spoiler Control Failures.

We were very surprised to hear our wing commander's voice over guard, as he had come down to Rapcon to assist. He asked us to make one more check of the procedures we had followed, and then the PAR final controller took over and directed us to a full stop. It sure was good to see the emergency vehicles out in force. Even though we had more serious problems than radio failure, good communications would have been mighty comforting.

Now that I have had time to analyze what we did in our particular situation, I can easily see that while it is impossible to know word for word what is written in every manual, it is easy to know where to find the information at a moment's notice.

The General Planning Section of the FLIP and the IFR Supplement contain a wealth of information that applies every time we fly and not just while we were being questioned by Check Section in UPT. If one takes the time during the annual instrument refresher course to reread these documents and recall the important highlights, instead of hurrying to complete another question, an emergency situation can be handled more professionally. While the possibility of complete radio failure is extremely remote, it did happen to me and could happen to you.



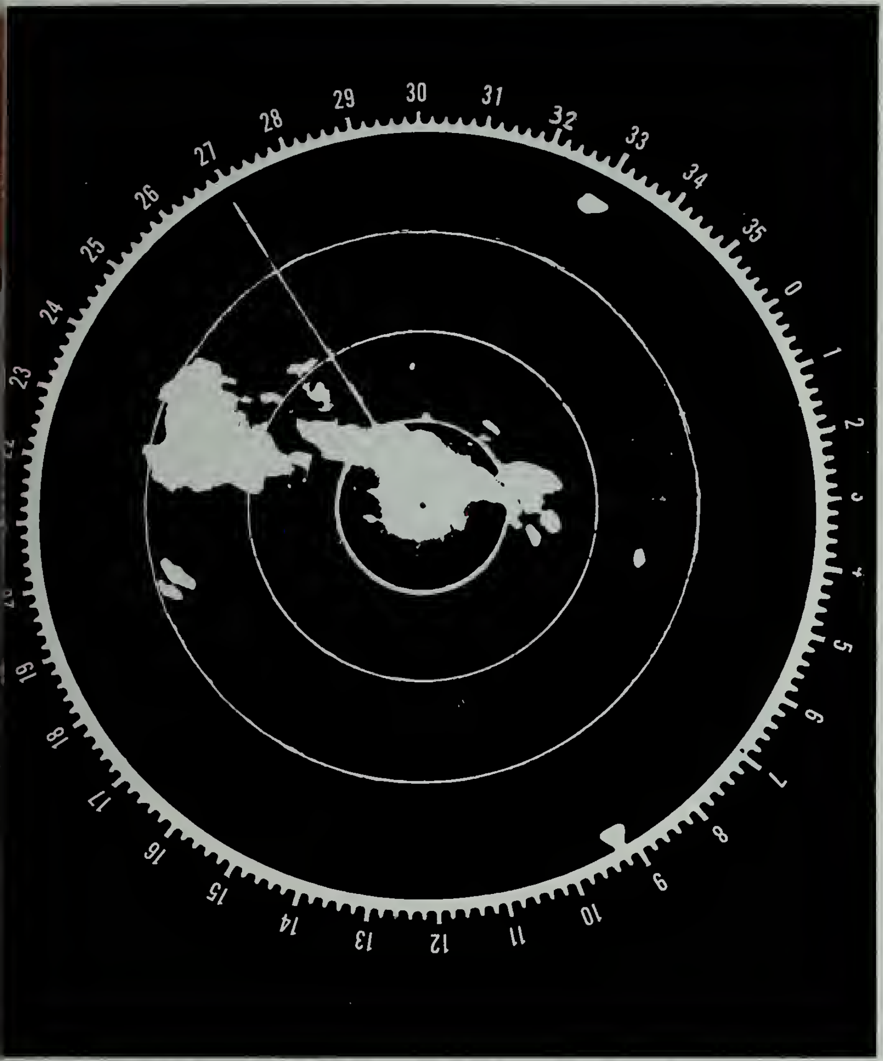
SEVERE WEATHER

The following article includes highlights of an FAA Advisory Circular on the subject of severe weather avoidance.

The need for exercising prudent judgment with regard to flight through areas of known or forecast severe weather is well recognized. Flight through severe weather activity should be avoided if possible.

Present procedures provide for controllers to assist pilots, particularly when operating on IFR flight plans, in avoiding areas of known severe weather. It is important, however, that all parties concerned with aircraft flight operations be fully aware that there are at times limitations to an air traffic controller's capability to provide such assistance. There are several reasons for this. First, it should be recognized that the controller's primary responsibility is to provide safe separation between aircraft. No additional services can be provided which will derogate performance of a controller's primary responsibility. Secondly, limitations of ATC radar equipment, communications congestion, other air traffic, etc., may also reduce the controller's capability to provide any additional services.

To a large degree, the assistance that might be rendered by ATC will depend upon the weather information available to controllers or the request by pilots desiring to avoid severe weather areas. Due to the



AVOIDANCE

extremely transitory nature of severe weather situations, information available to controllers might be of only limited value unless frequently updated by pilot reports or radar weather information. In-flight reports from pilots in direct communications with controllers giving specific information as to area affected, altitudes, intensity and nature of severe weather can be of considerable value. Such reports, when received by controllers, should be relayed to other aircraft as appropriate.

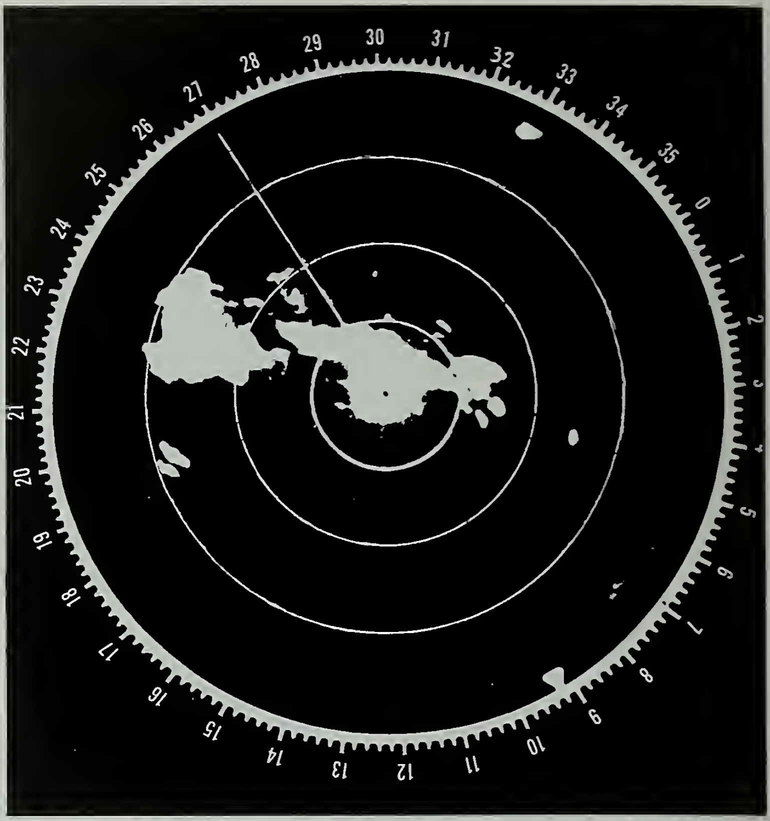
Should a pilot desire to avoid a severe weather situation along his route, he should request such deviation from route/altitude as far in advance as possible, including information as to the extent of deviation desired.

Obtaining IFR clearance to circumnavigate severe weather can often be accommodated more readily in the enroute areas away from terminals because there is usually less congestion and therefore greater freedom of action. In terminal areas, the problem is more acute because of traffic density, ATC coordination requirements, complex departure and arrival routes, adjacent airports, etc. As a consequence, controllers are less likely to be able to accommodate all requests for weather detours in a terminal area or be in a position to volunteer such routes to the pilot. Nevertheless, pilots should not hesitate to advise controllers of any observed severe weather and should specifically advise controllers if they desire circumnavigation of observed weather.

Weather Phenomenon as Observed on Radar. It must be recognized that those weather echoes observed on radar (airborne or ground) are a direct result of precipitation. Radar does not display turbulence. It is acknowledged that turbulence is generally associated with heavy areas of precipitation; however, the radar used for air traffic control purposes is not capable of equally displaying precipitation information. Under certain conditions, in the past, echoes received from precipitation rendered ATC radar unusable. To avoid such disruption to radar service, modifications designed to considerably reduce precipitation clutter were added to ATC radar systems. This feature, known as Circular Polarization (CP), eliminates all but the heaviest areas of precipitation. Terminal radar systems use this feature as necessary to reduce precipitation clutter during moderate to heavy rain or snow. Moderate to heavy precipitation areas appear on the radar scope as white areas.

Centers normally use CP only when the radar data processing computer is inoperative. When this occurs, a secondary radar system (Air Traffic Radar Beacon System) is used along with primary surveillance

SEVERE WEATHER AVOIDANCE Continued



radar. This combination is normally used at the lower altitudes where positive control airspace is not applicable. Aircraft operating in positive control airspace are required to be equipped with operating radar beacon transponders and controllers handling such traffic normally utilize only the secondary radar system. These secondary ATC radar systems receive only those signals emitted by airborne radar beacon transponders and do not display weather echoes. Additionally, this permits filtering out nonpertinent traffic operating below the positive control areas. Though controllers using only secondary radar will not observe weather on their scopes, they can if alerted often turn on the normal radar to observe weather, provided this will not result in weather clutter rendering the scope unusable for traffic control.

Air Route Traffic Control Centers normally operate in the radar data processing mode. In this configuration, the computers process radar returns and display them on the controller's scope as symbols or alphanumeric characters. This computer also analyzes radar returns from precipitation areas in degrees of intensity. It then displays the area of precipitation on the radar scope as a series of parallel or slightly diverging lines if the precipitation is light or as a series of the capital letter H if it is heavy. For this function, light precipitation has been classified as a precipitation fall of less than five but more than one inch per hour. Heavy precipitation is classified as five or more inches per hour. This system capability enables the controller to recognize variations in the intensity of precipitation without rendering the ATC radar unusable.

In accordance with current procedures, controllers will provide information concerning severe weather echoes observed on their radar when deemed advisable and will, upon pilot request, suggest vectors for avoidance whenever circumstances will permit. However, for the reasons outlined above, it is emphasized that pilots should not completely rely on air traffic controllers to provide this service at all times, particularly in terminal areas or in holding patterns. Pilots should also recognize that the controller's data are often far from complete due to the design of the radar and its location relative to the weather observed.

Recommended Actions.

- Avoidance of known severe weather. Recent research has proved beyond any doubt that all thunderstorms are potentially dangerous and should be avoided.
- Forward reports to ATC of any severe weather encountered giving nature, location, route, altitude and intensity.
- Initiate requests to avoid severe weather activity as soon as possible being specific concerning route and altitude desired. Crews are reminded to review the Airman's Information Manual pertaining to "Detouring Thunderstorms and Weather."
- Adjust speed as necessary to maintain adequate control of aircraft in turbulent air and advise ATC as soon as possible.
- Do not rely completely on air traffic controllers to provide information or to initiate radar vectors to aircraft for avoidance of severe weather, particularly when arriving and departing terminals or in holding patterns.
- Plan ahead to anticipate the need for avoiding areas of known severe weather. If necessary delay takeoff or landing as applicable.

HABIT PATTERNS GOOD or BAD

Anon E. Mouse
Grand Forks AFB

Good habit patterns developed over the years generally help keep us out of trouble. Unfortunately, sometimes these habit patterns are broken and we do not always realize it. When this happens we can get into trouble.

I am an experienced boom operator and I have developed what I consider to be good habit patterns. On a recent training mission, I unconsciously broke one of my habits and I did not realize what was in store for me. I would like to relate what happened on this mission and the lessons I learned.

The mission plan was more than routine: a celestial navigation leg, air refueling with 12 A-7 fighters, another navigation leg, and a quiet return to home station. As the boom operator, I had a good day's work cut out for me.

As we approached the air refueling area, I checked off interphone and proceeded to the boom pod with my parachute on. I had my checklist, helmet, portable oxygen bottle in hand as was my usual habit. I noticed, as I headed for the boom pod, that our three additional crewmembers were following me. They obviously hoped to observe some of the techniques and procedures that I would be using to refuel the A-7s.

Climbing down into the pod, I placed my helmet and oxygen bottle on the floor of the pod instead of on the pallet to my left. I did this to make room for the additional crewmembers so they could observe more easily. This was not my normal procedure and I had done it without thinking.

I informed the pilot that I was in the pod on interphone and proceeded to accomplish my checklist. The boom checked out operationally, the fighters came in and everything was going as planned.

I left the boom in trail while I waited for the last flight of three receivers. I noticed a couple thin streams of light brown rusty colored fluid streaming across the boom pod left scanning window. Not much really, about enough to fill an eye dropper in 15 minutes, but it did raise my curiosity because I could not figure out where it was coming from. I did not know of any fluid of that color aboard the aircraft. I informed the pilot and felt around the bottom of the pod looking for a clue. I vaguely remember moving my oxygen bottle and helmet. Then my attention was diverted to the last group of fighters that had just reported up on the air refueling frequency.

The first A-7 was a beautiful receiver. Now for number two. Contact was normal but the boom seemed sort of stiff. Something seemed to be binding in the system, so I called for a disconnect. The boom retracted and even when I exerted what I considered excessive pressure, it would not go below 28 degrees. I then started looking around closer. You guessed it. My portable oxygen bottle was UNDER the control stick. I removed it and everything checked out like it was supposed to. I then finished the job as my audience snickered at what I had done.

Several things could have happened on this mission. With a receiver in contact, if he moved to the lower envelope area the boom could have been broken off or the control rods and cables could have been broken and I could have lost control of the boom. If I had needed oxygen in a hurry I might not have been able to get it in time. Just call me lucky!

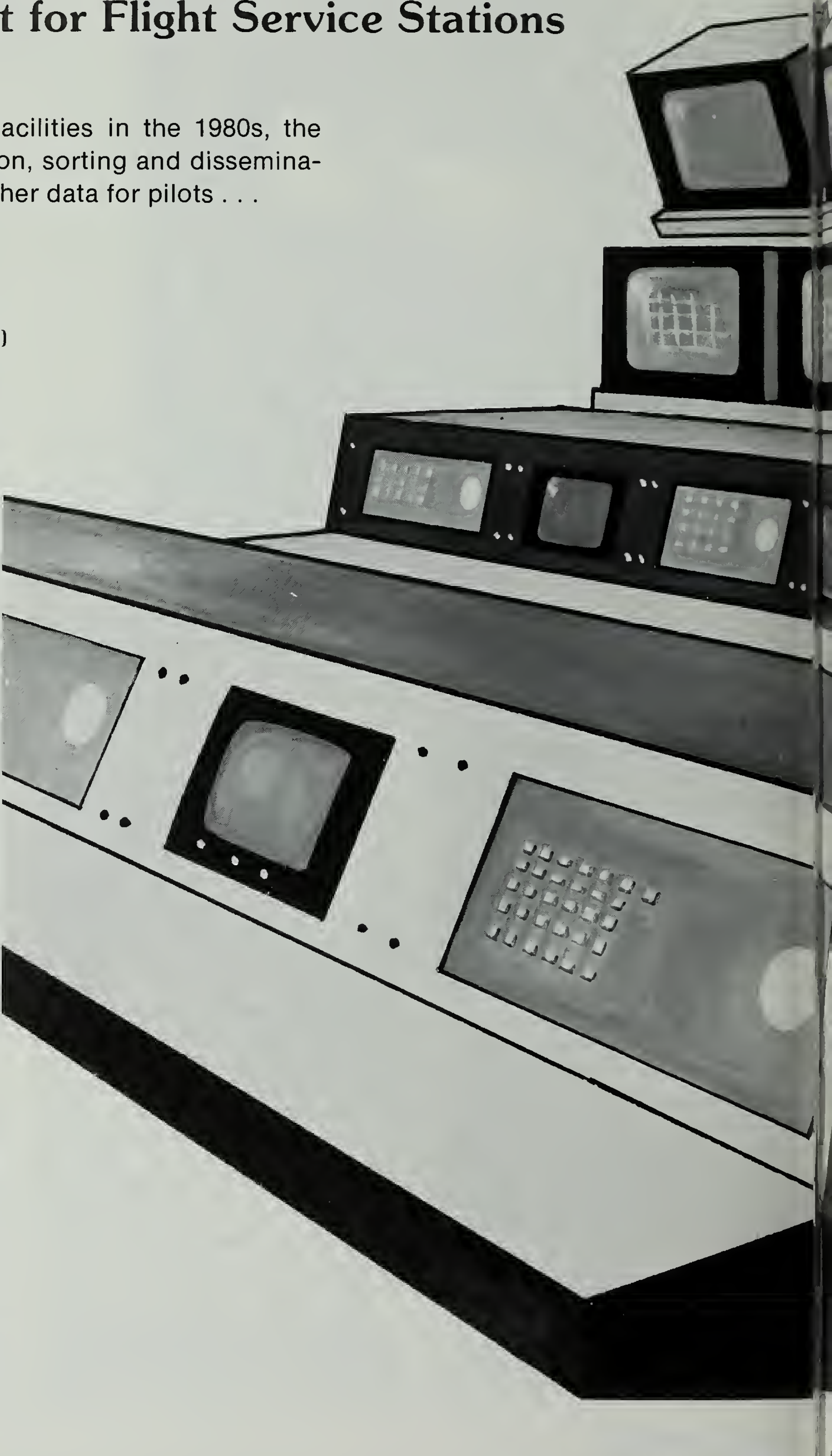
I learned a couple of valuable lessons on that mission: not to change a good habit pattern without making a positive mental note at least and that damage to equipment can be easily caused by items not being placed or secured properly.

Oh yes, the rusty brown fluid. We really do carry rusty brown colored fluid on the KC-135. It was seeping from the APU fuel vents. I definitely had not expected to learn this much in one mission.

Automated information processing system under development for Flight Service Stations

Intended for update of U.S. facilities in the 1980s, the concept involves rapid collection, sorting and dissemination of weather, NOTAM and other data for pilots . . .

Bruce C. Abernethy
Director of Data Systems
Garland Division, E-Systems, Inc. (U.S.A.)



A computerized flight-information processing and display system began test and evaluation by the U.S. Federal Aviation Administration (FAA) in July 1975.

Operation of the AWANS — an acronym for Aviation Weather and NOTAM (Notice to Airmen) System — will be studied for one year at the Flight Service Station (FSS) in Atlanta, Georgia. Part of a ten-year FAA plan to modernize its FSS facilities across the nation, AWANS is the test-bed for automated "no-paper-work" flight services in the 1980s. The Atlanta FSS is located at the Charlie Brown (Fulton County) Airport, a major U.S. general-aviation airport.

General aviation accounts for over 90 per cent of all U.S. aircraft flying today. Airport-based FSSs provide vital flight information to these pilots, significantly contributing to flight safety.

The purpose of any FSS is to provide a number of flight information services to pilots, such as the filing, processing, disseminating, progress monitoring and closing of flight plans. Also included are the reception, processing and dissemination of en-route and terminal weather data and emergency assistance. Thus, most of these FSS functions can be grouped into three categories: (1) weather and NOTAM data dissemination, (2) air traffic control

Automated information processing system

(ATC) support activities, and (3) emergency assistance services.

Weather and NOTAM information handling involves the collection of several kinds of aviation weather and NOTAM data. It also requires the dissemination of interpreted data to the pilot by means of in-person and telephone briefings, by recorded telephone and radio briefings, by scheduled and unscheduled broadcasts and by en-route air/ground communications.

ATC support activities include handling IFR (instrument flight rules) and VFR (Visual flight rules) flight plans, relaying ATC messages and monitoring navigation aids.

Emergency services concern flight assists and the search-and-rescue alerting function. The latter includes VFR flight-plan progress-monitoring systems and various special reporting services.

Two main objectives sought

AWANS is designed to assist the FSS specialist in nearly all of the functions required of such stations. It speeds up data transmission through high-speed digital links, replacing present day teleprinter and facsimile lines.

Built around a multi-processor mini-computer system, the system is linked via modems over telephone lines to the U.S. Weather Message Switching Center in Kansas City, Missouri, The link-up also connects the system to the FAA Service-B network, which allows AWANS to communicate with other FSSs, to the National Meteorological Center weather facsimile circuit originating at Suitland, Maryland, and to the National Weather Service's slowscan weather-radar remoting system.

AWANS is designed to improve workload handling, and thus flight safety, by providing automated storage and retrieval of weather and aeronautical information. It has two principal objectives: (1) to improve the timeliness and usability of the information available to the FSS specialist and to the ultimate user (the pilot) and (2) to improve the productivity of the FSS specialist by making all information necessary for pilot briefings readily available to him at his position.

Under the current FSS method, the pilot requests briefing on a route for which he is filing a flight plan; then, the FSS specialist usually must wade through a maze of teleprinted data, facsimile maps and other material to obtain the necessary information.

With the automated system, the FSS specialist only has to punch keys on a keyboard/cathode ray tube (CRT) terminal. Specific required data — including weather conditions, potential hazards along the route and other pilot-briefing essentials — appear almost instantly on a display screen.

The main AWANS installation at Atlanta FSS includes 11 large well-mounted, 23-inch TV screens. These display weather facsimile maps and weather radar images. Sixteen smaller screens are used by FSS specialists in providing pilot briefings.

The system is intended to achieve, through the application of computer and display technology, more effective communications between the pilot and the experienced, trained FSS specialist — i.e., face-to-face or voice-to-voice. And, it should significantly simplify pre-flight and in-flight briefings for the FSS specialists.

One of the greatest benefits is speed; a specialist can recall and display his video screen information pertaining to a designated route or area almost instantaneously. Increased speed is one important factor in providing flight safety. In addition, the automated approach provides in-depth pilot briefings because of the availability of more detailed data.

Pilot self-briefing is a longer-term objective, but only to the extent that it will not impair pilot safety. It would enable the pilot to get his own flight-planning information through direct access to a computer.

Another concept, calling for automated pilot self-brief terminals (PSBT) by 1985, involves primary pilot self-briefing with the specialist playing a secondary role.

However, AWANS today is designed around the concept of improving efficiency of the FSS specialist, with pilot-briefing playing a secondary role. It was, in fact, designed by FSS specialists for FSS specialists, who have been involved with our Garland Division in every phase of system development.

Workload reduction important

AWANS will allow the FAA to handle the ever-increasing general aviation needs with professional services at no cost increase for facilities expansion and with the desired efficiency and flight safety.

For example, such automation streamlines the flight information system by eliminating the time-consuming task of sorting paper. Among other things, it supplants the FSS specialist's job of formatting flight-plan messages and then manually transmitting them over teleprinter networks.

Automatic formatting and transmission of flight plans and status messages significantly improve the number of pilot briefings and flight plans that can be processed in a given time period.

The new system sorts its information on a national basis. It has available for immediate call-up and review any active flight plan filed through AWANS. It also has the ability to reconstruct, from historically maintained data, the complete events associated with a flight.

For the FSS specialist, it will remind him of a possible problem if a flight plan has not been closed within a reasonable period of the estimated time of arrival. By assisting the specialist in obtaining information concerning the flight plan, it allows him to determine why the flight plan was not closed. If an aircraft is lost, AWANS enables the specialist to coordinate search and rescue operations.

Moreover, the system will provide more detailed weather information than the current teleprinter system. This includes surface weather observations from 700 nation-wide sites and weather forecasts from 300 of these locations. Available radar pictures show areas ranging from a 200 to 320 kilometre radius of any of the 52 National Weather Service radar sites.

The most current weather information is available to the system through the high-speed hook-up to the Kansas City Weather Message Switching Center (WMSC). The system accepts, stores, buffers and selectively displays weather and NOTAM data from the WMSC. Normally this information is transmitted over the FAA's slower weather teleprinter circuit, known as Service A.

The interface with the FAA's Service-B teleprinter circuit is for the reception and selective display of formatted flight-plan messages.

Graphic data, supplied to the system primarily by the National Meteorological Center in Maryland usually is transmitted over the National Weather Facsimile System. To reduce data-transmission time significantly, AWANS utilizes a high-speed digital communications system and digital video compaction techniques.

Finally, AWANS accepts and provides a video display of weather radar information available from the National Weather Service. Up to five weather-radar images displaying current, local, and regional weather are available to the specialist on a random-access basis.

The Atlanta FSS contains the main AWANS components. To test the concept of remoting a system, it also is linked to the FSS in Macon, Georgia, over telephones lines with similar terminals. Additional remote terminals are located at Atlanta International Airport and in Washington, D.C.

AWANS, we believe, represents an answer to the challenge of the decade — general-aviation growth. General aviation in the U.S. has doubled in volume during the last 10 years; and, it will account for the greatest increase in the number of aircraft, pilots and hours flown over the next decade.

It has been estimated that by 1990, such growth would compel the FAA to more than double its manual FSS work force from today's 4,700 to over 11,000. The existing FSS systems would cost an estimated $300 million per year to operate by 1990. Thus, the present system is considered "technologically obsolete."

The solution seems to lie with the installation of equipment and facilities tht will accommodate this expected general-aviation growth without proportionate increases in FAA man-power and other costs. Once developed, the FAA estimates that the planned automated system could operate at one-third the cost of the present system.

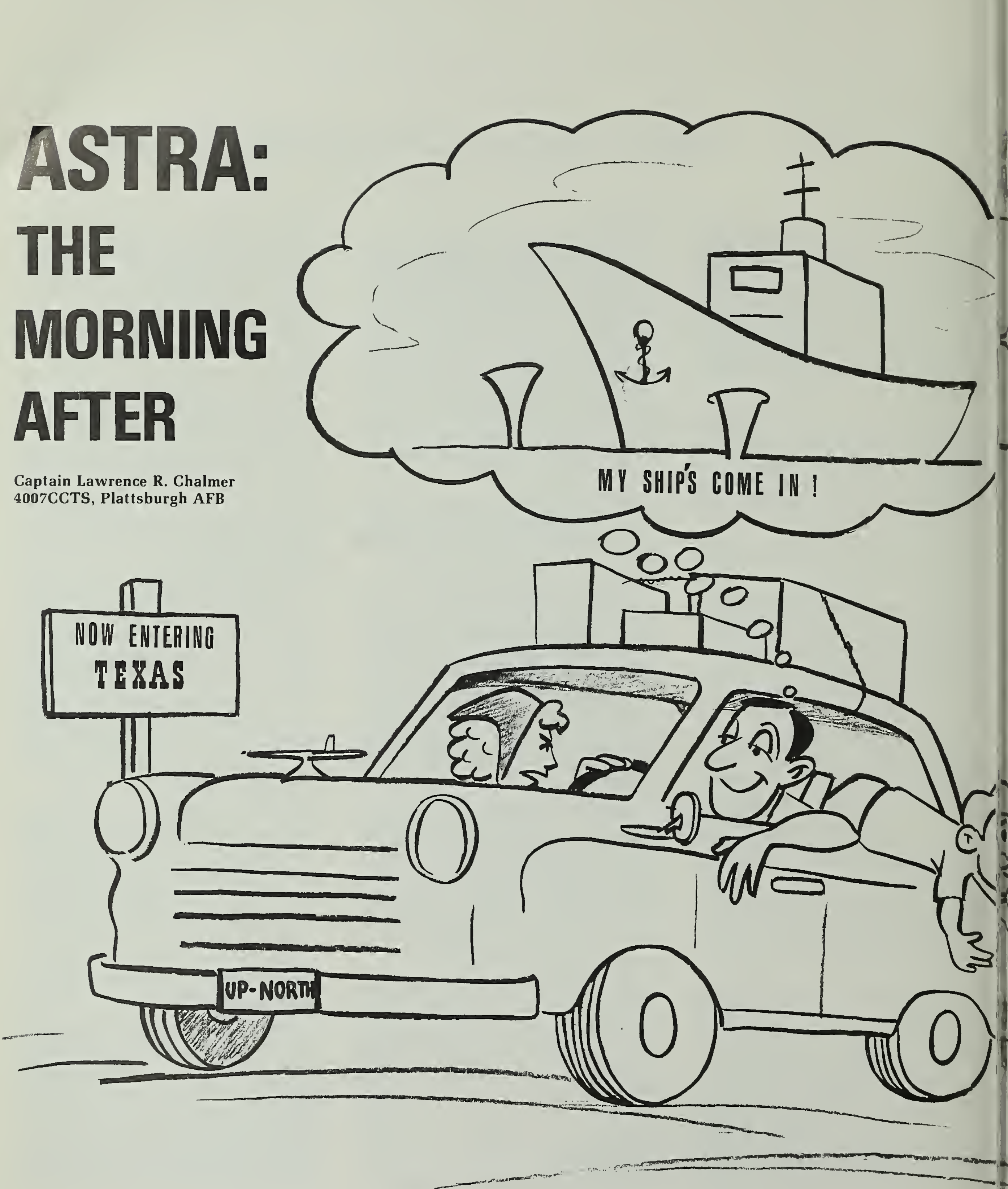
Some contend that the human element — the personal touch of the FSS specialist — is necessary to ensure flight safety. This is especially true, they say, regarding specialist interpretation of marginal weather conditions based on personal knowledge of the pilot and his aircraft. AWANS emphasizes the human element of flight services.

With the developmental concept, as represented by the system installed at the Atlanta FSS, the specialist speaks via telephone with the pilot at home or in the airport, by radio with the pilot in the aircraft, and face-to-face with the pilot in the FSS itself.

(Reprinted from ICAO Bulletin)

ASTRA: THE MORNING AFTER

Captain Lawrence R. Chalmer
4007CCTS, Plattsburgh AFB



A tale in which Captain Naive, fresh from his aircrew duty and gravity-defying air machine, comes to enter the land of staffwork, heartburn, and greenstamps.

I had been selected to be an air staff training officer. After years of covering my walls with rejection letters, ("you have been considered, but not selected") from similar major command programs, my (if you'll excuse the naval expression) ship had come in. My flight had arrived. The proverbial bird of fortune was sitting on my shoulder. What an occasion to celebrate! What a time to let it all hang out. I, Captain Naive, celebrated all right. I stepped smartly into the nearest BX and purchased that ultimate symbol of the professional staff officer, a pair of new corfam low-quarters! There'd be no stopping me now.

The normal PCS move followed. Old clunker car with me, my wife, newly arrived baby boy, and dog left the snow country enroute to sunny (read humid), air conditioned (read none in car), Texas, and the Military Personnel Center.

We arrived. In new shoes, I was greeted by the sight of my sponsor driving a 1951 Pontiac. Yes, I had entered the land of rust-free sunshine. My sponsor then introduced me to the Colonel, my director and boss. The salute I gave him was sharper than any cadet's. The Colonel advised me that at the Air Staff we didn't salute indoors; there wasn't time for all the formalities. My naivete was beginning to rub thin. The General's secretary specifically told me not to salute. I found a home.

Action: that piece of work for which a specific individual (the action officer!) is responsible. I became an action officer. The investiture was brief. I was led to a desk, pad, pen, phone, and suspense. A suspense is an action which must be completed within a certain period of time. My first suspense involved sending information and a personal reply from the Secretary of the Air Force to a national business organization. I was beginning to realize the term *suspense* kept the action officer in exactly that. My reply complete, I was preparing to forward it to Washington for approval when the director's secretary asked about my coordination. Thinking I

might appear clumsy, I replied in my most professional manner, "My what?" Naivete had struck again. The Air Staff runs on coordination (among other things besides coffee), or getting approval from everybody on everything. Thence came my first *faux pas.* In my rush to meet the suspense and acquire the necessary coordination, I sought the signature of Colonel X whose office was near my own. Into her office I wandered, thinking that this Lt Colonel would sign where appropriate and I'd be off. No knock, no telephone calls for me. In I went, the junior crusader. In I went, head down, mumbling into paperwork, eyes raised slowly to stare at a rank of eagles, not leaves. On my way out, I tripped over a big chunk of naivete.

The first time I heard our director and boss say he had heartburn, I thought I'd found a kindred spirit to lead me to the pastrami and horseradish. Not so, "heartburn" at the Air Staff meant displeasure, problems, dissatisfaction. I learned too that while seeking coordination from other agencies, an action officer gives green stamps; i.e., one favor deserves another. Your fellow action officers, upon needing your boss' coordination would cash in the green stamps you'd given them in seeking their help in your coordination process.

Last year, I had the opportunity to participate as an assistant recorder on a selection board. A roomful of colonels and generals weighed the histories and futures of my fellow officers. Self-conscious? Believe it. Some of these senior officers started at 0610 and didn't look half as sleepy as I did. My faith in the promotion process was renewed after working with this selection board. The panel members I observed were thorough, conscientious, and made it a point to instantly question any record segment with which they were unfamiliar. The nonrated individual can evaluate the rated, and vice-versa. From this experience came my firm belief that the person who fails to maintain current records has no one to blame but himself.

Now many months after that first morning's handshake, I've learned that the mysterious "they" of the Air Force is not so mysterious. The "theys" of the Air Staff are you and I, but with a different mission. While we watch over one aircraft, or one squadron, or one bench, or one student, "they," the Air Staff, monitor, and manage programs affecting all of us. The responsibility is broader, to be sure, yet the hand must be just as steady, the response time, in comparison, just as necessarily rapid, as in any weapon system or maintenance activity.

Those months of actions, conferences, briefings, and thousands of phone conversations are behind me. I was fortunate enough to have worked with aggressive, intelligent men and women at every level from the Pentagon to the base, and I'm looking forward to a future return to the Air Staff. You can be certain I'll become a missionary at my next base. The word I'll spread will be this: "they" know where we're going; they're receptive to new ideas; they welcome quality people; and "they" are us. Come see for yourself.

FY 78 ASTRA Application Procedures

To insure consideration by the FY 78 board, have a Form 90, indicating your volunteer status for ASTRA, submitted by your CBPO no later than 1 December. Only those officers eligible for the FY 78 program may volunteer. To be eligible, officers must, as of 1 Jan 77:

1. **Be in a Regular or Career Reserve status and be serving in the grade of captain.**
2. **Have less than seven years of total active commissioned service. (TAFCSD must not be prior to 1 Jan 70)**
3. **Have a DEROS in FY 78, if currently overseas.**
4. **If rated, have at least three years rated service.**

Formal application procedures and program descriptions can be found in AFR 36-20 and AFR 36-23.

ABOUT THE AUTHOR

This year, Capt Chalmer completed an ASTRA assignment at the USAF Military Personnel Center and is currently in FB-111 crew training at Plattsburgh AFB. From 1971 to 1975, he served as a B-52H navigator and radar navigator. Capt Chalmer has completed ACS college and holds a MA degree from Central Michigan University.

WING LOW

Continued from Page 5

X-WIND EFFECT ON DIRECTIONAL CONTROL

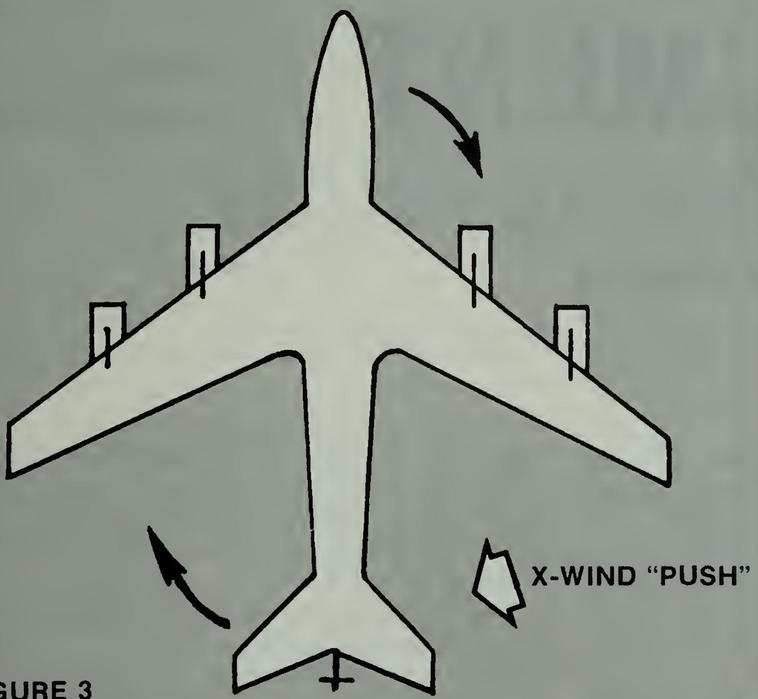


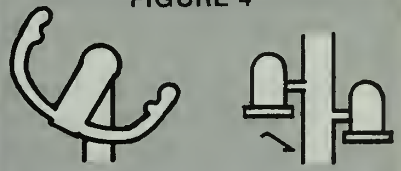
FIGURE 3

Up to this point we've reviewed crosswind techniques and aerodynamic effects while the aircraft is on the runway. Normally, getting the aircraft off the ground hasn't proved too difficult in the past. The supreme test seems to lie in getting the aircraft back on the runway and keeping it there without the aid of the engine pods. It is this decelerating phase where most crosswind problems occur. Around ½ mile out on final, you should be taking over visually and lining the plane up on the extended centerline. It is here where you should change the crab to a slip. Lower the upwind wing and apply opposite rudder to keep the plane on a straight path down the centerline. This will give you some idea of what control inputs will be needed in the flare (see Fig. 4). Try to cross the threshold with enough wing low and opposite rudder to stay on centerline. This is technically the same sideslip which occurred between S-1 and rotation.

Many pilots try to fly the plane in a crab until the flare and then make all the corrections at the same time. This transition from a crab to a slip requires a new aileron input, a new rudder input, pulling off power, and flaring the aircraft. It is easy to over control in this situation and often results in an excessive flare because it's hard to perform 4 items at once. The pilot who has the slip established before crossing the threshold only has to concentrate on pulling off power and flaring the airplane. The flare should be the same on every landing in the 135. Once touchdown is made, don't stop flying the airplane. The inputs may have to be increased to maintain centerline because as airspeed is decreased the control surfaces become less effective. The Dash One also tells us that abruptly raising the speed brakes may cause a slight yaw in a crosswind. This is due to the speed brakes on the upwind side acting like the stabilizer and results in a yaw into the wind (see Fig. 1). As the pilot, you should be ready to counteract this yaw with rudder. Once the nosewheel is on the ground the copilot **always** holds the yoke full forward with his right hand and has control of the ailerons.

It is imperative the copilot understands his duties in helping the pilot maintain control of the aircraft. The copilot should not release any of the aileron input and he should be prepared to apply more aileron into the wind if the upwind wing starts to rise. The airplane should decelerate normally below 90 knots and nosewheel steering should start replacing the rudder for directional control unless the runway is wet or icy.

FIGURE 4



Crosswinds may appear at any base at anytime so it is important that every pilot familiarize himself with the best techniques for getting the airplane safely on and off the ground. The best insurance is to be mentally prepared for any situation which may arise. Knowledge of the Dash One is the cornerstone to building a good pilot but this should be supplemented by practical experience and expertise. New pilots can grow in practical experience by participating in hanger flying sessions with the "old heads" of the squadron. If you remember the crosswind techniques mentioned here and stay a few minutes ahead of the airplane, you should have no trouble in making safe landings in crosswinds and prevent the nacelles from making the "Outrigger Test".

BIG INSTRUMENT

VISIBILITY - TO LAND OR NOT TO LAND

PART IV - GOING VISUAL

Captain John L. Wilson
1st Combat Evaluation Group
Barksdale AFB

The first three articles of this series discussed weather phenomena, the runway environment, and the directions for flying low visibility approaches. The last two parts will give you an idea of what you will see at DH when the weather is down around your ears and discuss some crew techniques you may want to employ in transitioning from the approach to landing.

Have you tried to form a mental picture of what you would see at DH with the visibility at RVR24? The typical answer is — "about a half mile" which under the right circumstances may be correct, but generally your forward visibility will be less than a half mile. Before proving this, a little discussion about assumptions made in presenting this material is in order.

There are many variables involved in what you will actually see out the front window of the aircraft. The weather and lighting conditions have the biggest influence. For the purpose of this article, it is assumed that the slant range visibility (the view from the aircraft to the ground) is the same as the RVR. An RVR of 2400 feet is the visibility used throughout the article. Slant range visibility can be less than the reported visibility under the proper circumstances.

A fairly typical precision approach has a 2.5 degree glide slope with the Ground Point of Intercept (GPI) of the glide slope with the ground at 1000 feet down the runway. This gives a threshold crossing height (TCH) of 43.7 feet AGL (Fig 1). By applying a little trigonometry it is possible to determine the aircraft distance from the end of the runway at Decision Height (DH). This distance computes to 3580 feet (Fig 2). Notice that this position is 580 feet short of the first light bar of an A-1 approach lighting system. With a slant range visibility of 2400 feet, the last light bar you would be able to see is the one 1200 feet from the runway threshold. The runway and the 1000 foot cross bar would be hidden from view or so indistinct as to be unusable for visual flight.

The other factor that limits your visibility is called the Downward Vision Angle (D.V.A. in Fig 2 and 3). The D.V.A. is the angle between the horizontal and the lowest point visible, and is due to aircraft structure such as the nose or the front wind screen. Pilot seating position and aircraft attitude both affect the D.V.A., but it is approximately 15 degrees for the B-52 and KC-135. As a result of the D.V.A., the closest point visible to the pilot is 746 feet in front of the aircraft. As a result the first light bar visible is 2800 feet from the threshold.

Combining the results of the Slant Range Visibility and Downward Vision Angle gives 17 light bars or a little over 1600 feet of ground visibility. Not much when your ground speed is 228 ft/sec (135 KTS) and you are trying to decide if you

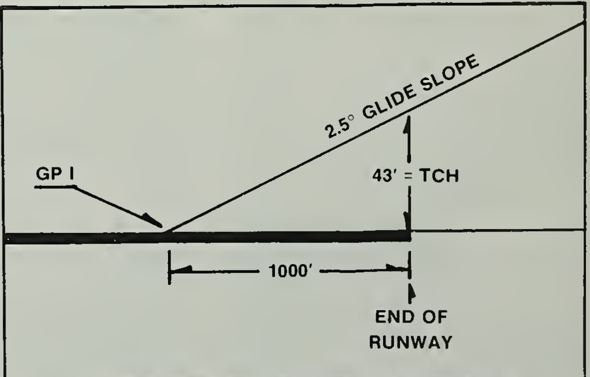


FIGURE 1. PRECISION APPROACH PARAMETERS

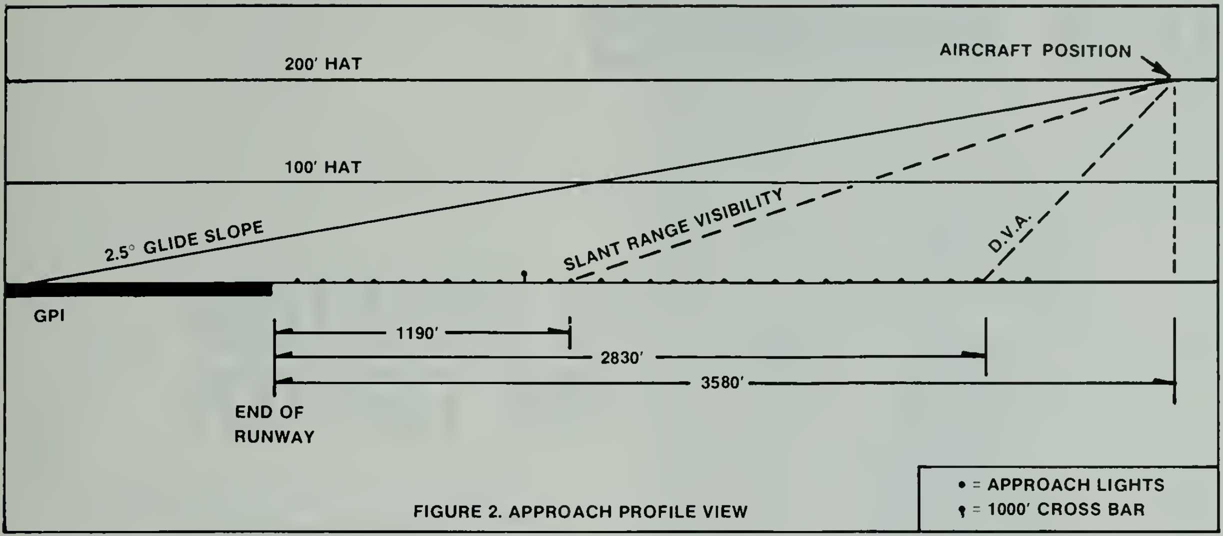


FIGURE 2. APPROACH PROFILE VIEW

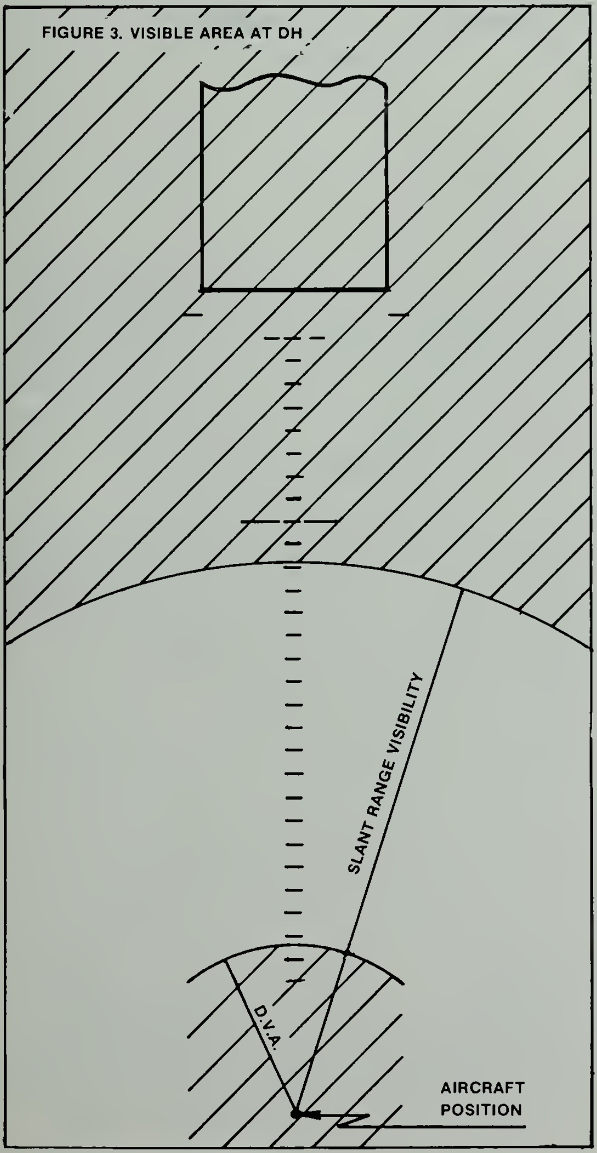


FIGURE 3. VISIBLE AREA AT DH

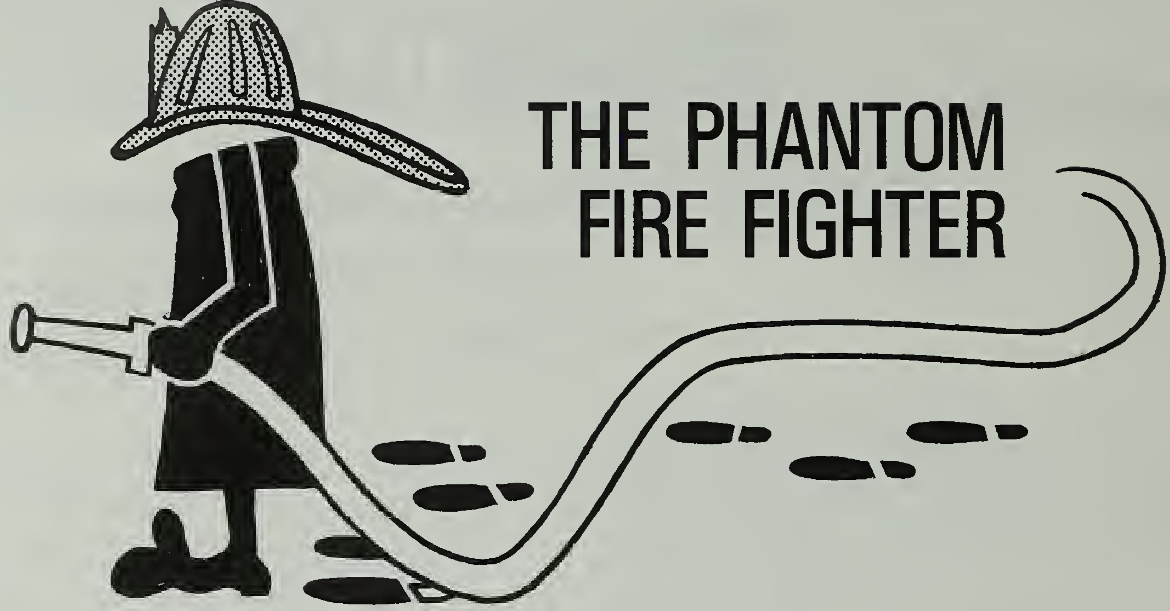
can land or not. As the approach is continued below DH, the ground visibility will actually improve, primarily because the distance hidden due to aircraft structure becomes less. At 100 feet AGL for instance, the ground visible to the pilot will be about 2000 feet and will probably include part of the runway. But for SAC crews, the decision to land would have already been made. Figure 3 shows, from an overhead view, what would most probably be visible at 200 feet HAT, the shaded areas being hidden or indistinct. So far this discussion has been based on an A-1 lighting system. With a Short Approach Light System (A-2 thru A-5), which is only 1400 to 1500 feet long, much less of the lighting system will be visible at DH.

Keep in mind that the numbers presented in this article are only valid under the conditions stated. Weather conditions, pilot technique and electronic equipment tolerances will all affect how well you can see at DH. Just because the reported visibility is at or above the published visibility minimums does not mean you will be able to position orient yourself when you reach DH. The situation is dynamic and continuously changing, requiring constant awareness of all factors in order to make sound logical decisions.

Note: Next month's article will discuss crew techniques that can be used during low visibility landings.

OPS HAZARDS

THE PHANTOM FIRE FIGHTER



The crew training mission progressed normally up to low level entry. Entry into OB-20 was aborted due to weather, and the aircraft remained at FL 250. Shortly thereafter, at approximately 2315Z (1615 PDT) the Instructor Pilot (IP) occupying the jump seat notified the pilot that he smelled an acrid odor in the crew compartment. The pilot also noticed the odor and directed the crew to go on 100 percent oxygen. An emergency was declared and an emergency descent to 12,000 feet was accomplished. As soon as terrain permitted a further descent to 10,000 feet was accomplished. The aircraft was depressurized, the airconditioning master switch was placed in the ram position, and the sextant port was opened. The IP asked that the fire extinguishers be checked for possible discharge. Initial replies from the radar navigator and gunner were negative. But upon recheck the gunner noticed that the upper deck extinguisher indicated a pressure of 45 PSI. Normal servicing pressure for the A-20 Chlorobromomehtane type extinguisher is 150-175 PSI and on preflight the pressure indicated 165 PSI. Shortly thereafter both the pilot and gunner complained of headache, dizziness, and burning eyes. The gunner also complained of chills and nausea. None of the other crew members complained of any symptoms or ill effects. At this time the IP and pilot changed positions, and the pilot and gunner rinsed their eyes with water. After the odor had dissipated the fire extinguisher was turned upside down and the remaining pressure was discharged into the urinal. Approximately 45 minutes after the occurrence the aircraft was repressurized and a climb to 14,500 feet was accomplished for the return trip home. A HOTEL CONFERENCE was established and fuel was burned down to a landing weight of 300,000 pounds. The IP landed the aircraft without further incident.

The aircraft was met by the flight surgeon and the pilot and gunner were transported to the hospital where they were admitted for observation. Neither experienced any lingering after effects and both were released early the following evening. The investigation of this incident revealed:

- This was the second mission for the gunner since returning from CCTS.
- Prior to the scheduled low level entry the gunner had moved to the lower crew compartment to observe the low level operations of the RN and navigator.
- After the low level was aborted, the gunner had just reached his ejection seat when the pilot directed the crew to go on 100 percent oxygen.
- The gunner stated that he was aware of the hazards involved with the A-20 (CB) fire extinguisher through his CCTS training and that at no time did he place his feet on or inadvertently bump the extinguisher.
- There are two types of extinguisher storage

brackets in use on B-52 aircraft. One has a tongue that fits over the lower handle and prevents it from being raised. The other does not. This aircraft was equipped with the tongue type bracket.

- There are three types of heads in service on A-20 extinguishers. All three have an interlocking feature on the two activating handles so that the lower handle must be raised before the upper handle can be depressed to activate the extinguisher. Only the newest type head has a drilled hole through the handles to allow insertion of a safety pin. The design of the older heads does not lend itself to the drilling of these holes.
- No tech data could be found which requires any additional safety device mechanism other than the interlocking feature on the handles. A safety pin is not required on the new type head.
- The subject extinguisher, S/N 80-4661, had the new type head installed and was not pinned. Last inspection was May 76.
- Several tests were made on the extinguisher. The extinguisher was pressurized with air to 250 PSI and immersed in water. No leaks were detected. The extinguisher was disassembled and all parts appeared normal. The parts were taken to the NDI lab where no indication of cracks or other defects could be found.

The reason for discharge was never determined. The next time you preflight the fire extinguisher, be sure to check for the phantom fire fighter.

DOUBLE JEOPARDY

After the B-52 took off and just prior to flap retraction a bang was heard followed by aircraft vibration. The #4 EGT went up to around 700°C then began to decrease; all other instruments began to unwind. The engine was shutdown by the crew and the mission continued. On return to the local area the crew wanted to perform maneuvers requiring 8 engines so they decided to restart #4. The EGT again went out of limits and the crew shut it down and decided against another restart. The dash one specifically states that all instances of overspeed or overtemperature will be recorded on the 781 in order that the engine may be inspected for possible damage before being released for further operation.

While a strong sense of mission accomplishment is a desirable trait and is inherent in professional SAC crew members, it must never replace good judgment and compromise flying safety during peacetime operations.

CAN YOU SPELL IT . . .

Continued from Page 3

presents itself, you will have a "warm feeling" about going to maintenance duties. I experienced that "warm feeling" recently when General Dougherty told me I was moving over to the top logistics job in the command. He said, "Jack, I have a job for you in maintenance — can you spell it?"

Well, how big a job is it? — SAC has over 21,000 officers assigned, of which approximately 1,250 (6%) are maintenance officers. These officers lead and supervise 50,000 maintenance people (47% of the SAC enlisted personnel). The SAC FY 1976 budget was 636.5 million dollars, and 17.8% of this (113.5 million dollars) was allocated to maintenance activities. If these figures haven't impressed you with the magnitude of the job, how about this for a super challenge in leadership, training and management for these maintainers. In FY 76 the Strategic Air Command lost 302 (24%) of its maintenance officers. The average annual unit "turnover" rate for enlisted maintenance people is about 50%. Added to this is the turbulence generated within each unit by promotions and duty changes. I overheard a senior DCM put it this way: "Maintenance would be a challenge even if we were all master mechanics."

What will I be doing? Well, you won't be working 8 to 5, that's for sure. You will be attempting to provide operationally ready and capable aircraft or missiles day after day, seven days a week, with young, eager, and frequently inexperienced airmen. Believe me, you can't really appreciate the joy of praise for a good job until you experience, first hand, the wing commander's displeasure when your troops don't get the job done. You may be in transportation trying to keep our ancient high mileage vehicles running and up to standards; or you may be changing out an ICBM G&C (Guidance and Control) package at two in the morning. What will you be doing? You will be managing, leading, scheduling and fixing something with a minimum of resources, including trained personnel.

Will maintenance get me promoted? It certainly will get you recognition, experience and an in-depth evaluation of all your leadership and management abilities. You will not have to worry about that block on your OER marked "Not Observed." If that evaluation says you are the best, you will probably be promoted. First, however, you must take the initiative and apply for the job; and, second, you have to learn to "spell " it. Join the "mainten-ace's."

OTSL TRAINING TOPICS

... A SYNOPSIS OF NEW PROGRAMS FOR SAC AIRCREW TRAINING

It's that time of year again, learning the new TAC Doctrine. All three videotapes and reference guides (B-52, KC-135 and FB-111) should be available for your study. Those of you who maintain an OTSL Catalog should update your book (dated 1 Sep 76) on page 50 with the information at the bottom of this page pertaining to the new TAC Doctrine:

In addition to the TAC Doctrine changes, two new videotapes were produced reflecting the revisions to emergency action procedures. The first program, "SAC Aircrew Emergency Action Procedures, Revision Alpha," reviews the changes to SACR 55-45, Vol V procedures. The second program, "SAC Aircrew Emergency Action Procedures, JCS Messages," covers the actual JCS message formats.

OTSL hosted the SACR 50-13 (Nuclear Weapons Training Program) conference from 4-13 October. The results will be published in the next revision to the manual. OTSL also hosted the annual SAC Safety Management Seminar. It was conducted at Carswell AFB the week of 8-12 November for selected safety personnel from throughout the command and representatives from air staff agencies. It updated everyone on the latest accident prevention program methodology.

The initial B-1 training cadre of three Air Force officers was assigned to OTSL at Carswell AFB effective 31 October. They will serve as the nucleus of the SAC Instructional Systems Development (ISD) team for the B-1. They will be developing and implementing the total training system for B-1 aircrews. To accomplish this task, they will be thoroughly trained in ISD, become knowledgeable in B-1 systems, cockpit procedures trainer operations, all facets of flight simulation, and the demanding tasks of curriculum organization and individualized instructional development. The team chief is Major Robert A. Bragaw, a senior navigator with B-52, B-58 and FB-111 experience. The pilot member of the team is Major Edward R. Hale with B-52 and FB-111 experience. The defensive systems expert is Captain Raymond E. Borg with B-52 experience. The B-1 team will grow in both strength of personnel and scope of responsibility based on continued congressional funding of the B-1 weapon system.

* * * *

The OTSL Instructional Systems Branch has begun a KC-135 systems development program in cooperation with tanker personnel at air refueling squadrons. The aim of the program is to rewrite and expand the tanker videotape and sound/slide programs to be current and in line with the needs of the crewmember. We have already received several outstanding sound/slide programs done by Captain Frank R. Wood at Grand Forks AFB and Captain Dennis Knick at Grissom AFB. If you are interested in working on this higher headquarters directed program, please contact Captain A. J. Courtice at autovon 739-7021.

If you have any other questions or comments, contact us at any of the numbers listed in the OTSL Catalog.

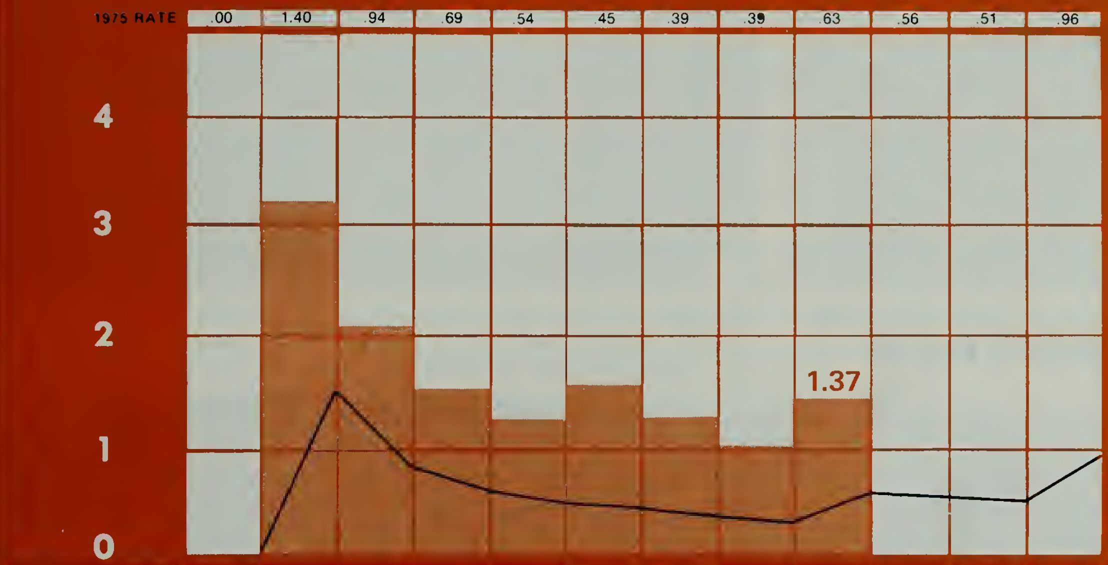
* * * *

In reply to the recent deficiencies identified by the SAC IG with respect to SAC Two-Man Policy training; OTSL is producing a videotape program on the SAC Two-Man Policy. This program combines reenactments of recent SAC Two-Man Policy violations with a concise narrative explaining the requirements and responsibilities of ALL personnel working in No-Lone Zones. The videotape will be ready for the field sometime around the end of October. You may have it now; Look for it.

Title	Class	Date	Length
SAC Tactical Doctrine, B-52 (SACR 55-21, Vol II) NOTE: Reel 2 applies only to SRAM units	S	23 Aug 76	Reel 1—46:05 Reel 2—20:30 Reel 3—30:00
SAC Tactical Doctrine, FB-111 (SACR 55-21, Vol IV)	S	16 Aug 76	Reel 1—52:28 Reel 2—18:22
SAC Tactical Doctrine, KC-135 (SACR 55-21, Vol V)	S	1 Sep 76	37:00

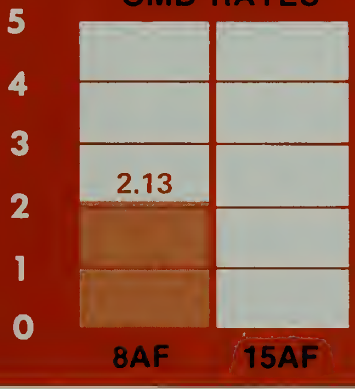
1976 Flying Safety Rate

SAC MAJOR ACCIDENT RATE (PER 100,000 FLYING HRS)



ACCIDENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1975	0	1	0	0	0	0	0	0	1	0	0	2
1976	0	2	0	0	0	1	0	0	1			

1976 SUBORDINATE CMD RATES



ACCIDENT STATUS

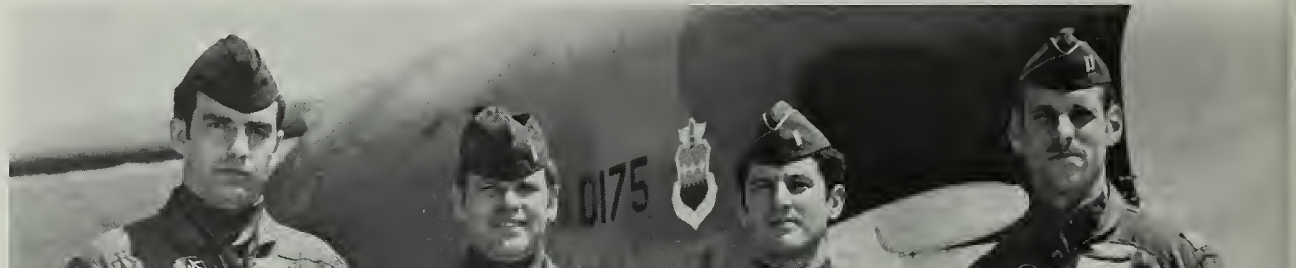
KC-135	FEB 76
FB-111	FEB 76
FB-111	JUN 76
KC-135	SEP 76

LEGEND —— =1975 RATE

PROFESSIONAL PERFORMERS

Individuals selected for these pages as SAC's top professional performers of the month are chosen from nominations made by all SAC units. Selection is made only after all nominations have been carefully screened and those chosen meet the highest standards of excellence as outlined in SACM 127-2.

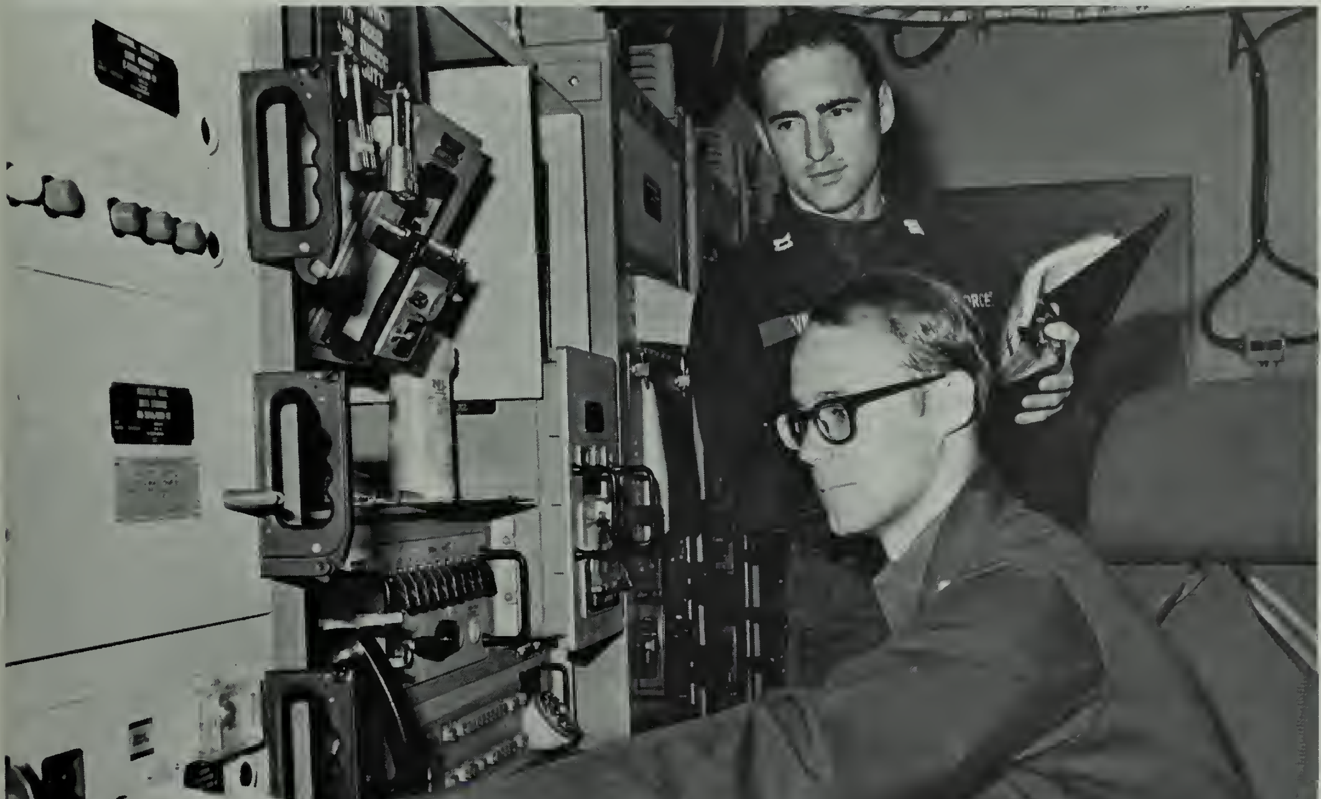
FLYING CREW



CREW R-05, 320BMW, Mather AFB: (L-R Standing) DAG SSgt William A. White, RN 1Lt Michael R. Forbes, CP 1Lt Robert M. Maddox, P Capt Michael A. O'Neal. (L-R Kneeling) IEW Capt John D. Quinn, and N 1Lt Douglas J. Muller.

TITAN Crew S-104, 381 SMW, McConnell AFB: MCCC Captain Craig E. McDonald, DMCCC 1Lt Soloman W. Washington, BMAT SSgt Thomas H. Martin, and MFT Sgt Mark S. MacWilliams.

MAINTENANCE MAN MSgt Roger P. Flick, 96 BMW, Dyess AFB.



MINUTEMAN Crew E-036, 341 SMW, Malmstrom AFB: MCCC Captain Herman W. Vogt, and DMCCC 2Lt Mark W. Schoning.

PINS IN ALASKA

Captain William T. Nuzum
6SW, Eielson AFB

Lt Christopher G. Knowles
305AREFS, Grissom AFB

"Barter Island Radio, this is Reno 28. Relay Anchorage Center Alfa Mike India Sierra and Alfa November Romeo Charlie Charlie, Break Break. Estimating the DEWIZ on Alfa route on course at 1535 Zulu, flight level 370, estimate Alfa 3 at 1631 Zulu." On Time? On course? These two phrases take on increased significance for SAC's KC-135 navigator flying in Polar regions.

Alaska, the home of the Eielson Tanker Task Force, and adjacent Polar regions are a navigational challenge to even the most experienced navigator. Normal aids to DR, which are available in other parts of the world, are extremely limited and at times nonexistent when flying at Eielson. The navigator is required to use all skills, judgment and experience at his disposal. Radar returns are reversed over half of the year; a phenomenon often never seen before by the navigator. Celestial navigation is complicated by long periods of twilight or continuous daylight. Radio aids are few and far between even over land.

These conditions, coupled with the lower experience level of SAC's navigators, pointed out the need for a more reliable aid to DR. The PINS, Palletized Inertial Navigation System, proved to be the needed aid. The entire PINS unit weighs only 80 pounds, is compact, and can easily be configured aboard the KC-135 in about 15 minutes. The PINS requires no aircraft systems input other than 115 volts 400 cycle AC power. The navigation unit (NU) bolts to the floor aft of the electronics cabinet in the galley area. The NU contains the inertial gyro, computer, battery and blower. Signal cables are routed forward and connect to the control display unit (CDU) and the mode selector unit (MSU) mounted at the navigator's station.

This system is so compact and mobile that three PINS serve the whole Eielson Tanker Task Force. A few hours prior to flight the system is installed on an aircraft. After the aircraft lands, the PINS is down loaded and immediately available for another aircraft launch. Thus, SAC is receiving maximum utilization and reliability with minimum dollar expenditures.

The PINS is extremely simple to operate. Only three steps must be accomplished in order to have an

accurate and continuous present position, true track (course), ground speed, true heading and drift. These steps are:

- Turn on to ALIGN
- Load present position
- Select NAV when READY NAV light illuminates.

These three steps normally require 15 minutes sequencing time to complete (depending upon temperature).

Additional in-flight information is available to the navigator if desired. Up to nine destinations (way points) may be loaded into the PINS. The PINS will now provide desired track between any two way points; distance and time from present position to the next way point (computed on current ground speed), miles left or right of track and the direction and number of degrees the aircraft is tracking in error. After passing a way point, the system will automatically sequence to the next point. Additional way points can be loaded at the navigator's discretion during flight.

With experience and by utilizing proper procedures, the navigator has a wealth of reliable information available to aid his DR. Drift and ground speed should be cross-checked between Doppler and the PINS frequently. The ASN-7 coordinates should also be checked for accuracy in conjunction with Doppler and N-1 inputs. Likewise, each celestial observation should have a manual DR, ASN-7, and PINS position accompanying it in order to help evaluate the LOPs. Quick reference ETAs, headings, and positions are readily available throughout the flight.

The reliability of the PINS at the Eielson Tanker Task Force has been phenomenal. For nine months of operations (Apr 75 to Jan 76) the PINS has flown 210 sorties for 1316 flying hours. Only two total in-flight failures have occurred and only two sorties recorded errors in excess of two NM per hour in the system. The overall average error per hour has been 0.67 NM.

Reliability of this nature could lure a navigator into a false sense of security. This must never happen, especially when flying Polar grid. Therefore, the navigator must check, cross-check, and recheck all available aids to DR in order to properly evaluate his position. If used properly, the PINS is a valuable aid to DR in the Polar regions; however, the old cliche "There is no substitute for DR," still applies.

Hopefully the experience and statistics completed by the Eielson Tanker Task Force will serve in the decision-making progress for an expanded use of PINS for the SAC KC-135. It proved to be a good investment for successful operations in Alaska. The PINS is a valuable aid to the SAC navigator — use it properly.

HALL OF FAME

TACTICAL FLYING

OVER SEVENTEEN YEARS

916 AREFS, Travis	Sept '59

OVER SIXTEEN YEARS

97 BMW, Blytheville	Mar '60
19 BMW, Robins	Oct '60

OVER FOURTEEN YEARS

11 AREFS, Altus	Feb '62
301 AREFW, Rickenbacker	Jul '62
96 BMW, Dyess	Aug '62
449 BMW, Kincheloe	Aug '62

OVER ELEVEN YEARS

320 BMW, Mather	Jul '65

OVER NINE YEARS

92 BMW, Fairchild	Feb '67
55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67

OVER EIGHT YEARS

319 BMW, Grand Forks	Dec '67
22 BMW, March	Feb '68

OVER SEVEN YEARS

5 BMW, Minot	Feb '69
42 BMW, Loring	Oct '69

OVER SIX YEARS

93 BMW, Castle	Nov '69
28 BMW, Ellsworth	May '70

OVER FOUR YEARS

7 BMW, Carswell	Mar '72
416 BMW, Griffiss	May '72
305 AREFW, Grissom	Aug '72

ICBM

OVER TWELVE YEARS

381 SMW, McConnell	Nov '63
90 SMW, F.E. Warren	July '64
1 STRAD, Vandenberg	Sep '64

OVER ELEVEN YEARS

308 SMW, Little Rock	Aug '65

OVER SIX YEARS

341 SMW, Malmstrom	Apr '70

To gain listing in the Hall of Fame, a SAC unit must be accident-free for 48 months.

SAC SAFETY SCREEN

97 BMW, Blytheville Crew E-11: P Capt Robert C Hinson, CP 1Lt Arthur B Carruthers, RN Capt Frank A Spivy, N Capt Frank B Bohannon, EWO Capt John W Carver, G Sgt Michael J Scheall

68 BMW, Seymour Johnson Crew E-08: P Capt William H Barton, CP Capt John F Westgate. CP 1Lt John E Dees, N 1Lt John H Williams, RN Capt John R Deese, EWO Capt Anthony J Kwan, G SSgt Wayne D Keefe

410 BMW, K I Sawyer Crew R-08: P Capt Larry J Hutchinson, CP 1Lt Michael C Geddes, RN Capt Steven K Liberman, N 1Lt James R Spitler, EWO 1Lt Frederick Cardinal, G SSgt Ronald L Jackson

19 BMW, Robins Crew E-106: P Capt Robert L Lesmerises, CP 1Lt William J Gift Jr, CP Capt John F Turnbull, N 1Lt Robert J Barrow, BO SSgt Calvin T Davis

379 BMW, Wurtsmith Crew E-42: P Capt George G Schmidt, CP Capt Gerald R Miller, NB 1Lt David H Tripp Jr, NN 1Lt Ralph E Mollet, NE 1Lt Peter R Killian, AG SSgt Bruce J Hillier

22 BMW, March Crew E-10: Capt Kimmel R Anderson, CP Capt William T Soldmann III, CP 1Lt Bobby L Fairless, NB Capt Max D Lunt, NN Capt Leonard J Ash, EW 1Lt Frank Lourenco, AG A1C Michael G Smith

28 BMW, Ellsworth Crew R-19: P Capt Gary R Dietzel, CP 1Lt Blaine E Trent, RN Capt John P Bouchard, NN 1Lt William L Smith Jr. EW 1Lt John P Lombardi, AG SrA Richard D Knapp

92 BMW, Fairchild Crew E-154: P Capt William Franta, CP 1Lt Robert Sittinger, NN 1Lt Christopher Woods, BO Sgt Donald Hall

319 BMW, Grand Forks Crew E-12: P Capt Dana R Staley, CP 1Lt Jack C Vanwey, RN 1Lt David E Youdal, NN 1Lt Guy S McKee, EW Capt Roger A Hamstreet, AG A1C Gary J Robb

44 SMW, Ellsworth Crew R-177: MCCC 1Lt Olin J Davis, DMCCC 2Lt Douglas M Wuerl

90 SMW, F E Warren Crew S-202: MCCC Maj Richard M Johnson, DMCCC 2Lt Michael C McMullin

91 SMW, Minot Crew E-112: MCCC Capt Thomas C Marsh, DMCCC 2Lt Edward A Brault

321 SMW, Grand Forks Crew E-085: MCCC 1Lt Michael R Brown, DMCCC 2Lt Paul R Deneker

390 SMW, Davis-Monthan Crew S-033: MCCC Capt Maurice A Coleman, DMCCC 2Lt Manuel Reta, MSAT SSgt John J Bergin, MFT SrA Robert G Curtis

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"I don't care what they say, this is carrying space available to far!"

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